DUV FEL Accelerator and FEL Physics Workshop
February 19-20 2004
Hosted by X.J. Wang & L.H. Yu

The Deep Ultra Violet Free Electron Laser (DUV FEL) at the NSLS is a unique platform for the development of high brightness electron beams, seeded free electron lasers and the use of FEL radiation for photochemistry experiments by the user science community. The DUV FEL facility consists of the following components:

- High Brightness Photoinjector ($\varepsilon_N \sim 4$ μm),
- 200 MeV S-Band Linac,
- Four Magnet Chicane Compressor,
- Ten meter NISUS wiggler ($\lambda_u = 3.9$ cm, K = 1),
- 100 MW, 200 fs Ti-Sap.....
- Operating HGHG FEL at 266 nn,
- Experimental Endstation for Photochemistry.

In the last year, the DUV FEL has achieved several important milestones:

- "**First Ultraviolet High-Gain Harmonic-Generation Free-Electron Laser**", , L.H. Yu, et.al., PRL 91, No. 7, 074801-1 [2003],
- **"Super Excited State Dynamics Probed with an Extreme-Ultraviolet Free Electron Laser**", W. Li, et.al, accepted in PRL [12/2003]),
- "**Experimental Characterization of a Space Charge Induced Modulation in a High Brightness Electron Beam**", T. Shaftan & Z. Huang, submitted to PRL [11/2003]).

To build upon these successes we are hosting a series of workshops to identify future scientific opportunities in both accelerator physics, specially beam physics and technologies critical to future light sources, as well as FEL applications.

In July 2003 the NSLS hosted a very successful workshop to explore the possible uses of the UV light presently available from the DUV FEL and also to give consideration to refinements of the DUV FEL which would provide even greater opportunities to the chemistry user community. In response to the users desires, the energy of the DUV FEL linac is being upgraded from 200 to 300 MeV to enable the production of pulses of 100 μJ of 100 nm light from the High Gain Harmonic Generation FEL. We are on a clear path forward to establishing the DUV FEL as a premier user facility for ultraviolet radiation which will enable state of the art gas phase photochemistry research.

With an eye toward advancing the accelerator and free electron laser R&D at the DUV FEL, the NSLS will host a workshop in February 2004 to "**explore opportunities for future experiments on fundamental electron beam and free electron laser physics that could be conducted using the unique capabilities of the DUV FEL facility**".

Topics for discussion will include:

- Cascaded High Gain Harmonic Generation,
- Chirped Pulse Amplification,
- Space Charge and CSR Induced Microbunching,
- Sub-femtosecond Pulse Generation,
- Ballistic and Velocity Compression,
- Start-to-end Simulation Comparison with Experiments.

We invite you, or your designated representative, to join us for this two day informal workshop to identify future opportunities for conducting original accelerator physics experiments using the DUV FEL facility. An informal report summarizing the workshop results will be circulated among the participants. Please let us know of how your group would like to participate (people, suggested talks, dates). The workshop will be held on Feb. 19-20, 2004. We look forward to seeing you at the workshop!

Best regards,

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